

# A KEY TO THE AUSTRALIAN FAMILIES OF ACALYPTRATE DIPTERA (INSECTA)

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(Figs. 1-5). Manuscript Received 23. 1. 58.

## SYNOPSIS

An artificial key to all the families of the superfamily Acalyptrata believed to occur in Australia and one other Australian family of similar facies is presented. Notes on the setting out of the key and some of the important characters used are included. The superfamily Acalyptrata is briefly defined and the family location of certain genera is emended. A list of families with the more important synonyms is provided.

## INTRODUCTION

Australian entomologists wishing to make identifications of Diptera have experienced great difficulty in allocating material to the families of the superfamily Acalyptrata and it has frequently been stated that no satisfactory key to the Australian families exists. Two important keys to the dipterous families of the world have been in common use in recent years, one in German by Hendl (1938), and one in English by Brues and Melander (1932), revised by Brues, Melander and Carpenter (1954). These keys are of great assistance but some of the characters used, most notably the number of breaks in the costa, are much too variable to warrant the importance attributed to them. Moreover these authors were not very familiar with the Australian fauna and many of the characters useful in placing Holarctic forms do not apply to Australian representatives of the same families.

The author has attempted to make the present key as comprehensive as possible. He has examined the descriptions and all available material of the more aberrant genera recorded from Australia and much material of unrecorded forms. The arrangement used in the key has not been arrived at quickly. The scheme has been altered many times and prolonged consideration has been given to certain points. It is now considered likely that only some of the more unusual forms as yet unknown to the author will fail to run to the correct family. However, it should be remembered that the Acalyptrata of the western half of the Australian continent are almost unknown, whilst there are probably some aberrant forms still to be discovered in the east.

The characters here used are frequently not available for distinguishing non-Australian forms. It has been found impracticable to attempt a phylogenetic arrangement. The characters which provide evidence for relationship between families are frequently too inconstant for use in the key.

Certain families have been stated to occur in Australia, but their presence must be considered doubtful as no species are recorded and no material is available. The family Cordyluridae, though once placed in the Acalyptrata, is now accepted as belonging to the Calyptrata. To avoid confusion it has been included in the key. The family Conopidae has been variously placed in the Acalyptrata, Syrphoidea, or in a superfamily to itself, the Conopoidea. Recent investigations suggest that the family is best placed in the Acalyptrata. The family Braulidae, which has been referred to the Pupipara and to the Phoroidea, is included in the Acalyptrata by some recent authors (*e.g.*, Hennig, 1938). The latter course is here followed.

Where there may be some doubt as to the reason for accepting a family as Australian or as to why a family is placed at a certain position in the key, the names of all Australian genera running to this point in the key are placed in brackets before the family name.

## NOTES ON SOME CHARACTERS USED IN THE KEY

*Wing Venation.*—There is still so much disagreement concerning the homologies of the veins in the Diptera that it seems best to adhere to an old, but not disused, system of numbering the veins from front rear. Only the subcosta (auxiliary vein of many authors) is here referred to by a name indicating its homologies in other groups.

In addition to the longitudinal veins there are three principal transverse veins, usually inaccurately called crossveins. These are the inner or anterior crossvein, the posterior or discal crossvein, and the anal crossvein.

The principal cells of the wing used in classification are the discal, anal and second basal cells. The form of the anal cell is an important character (see Figs. 2 to 4). Fig. 1 illustrates the terminology of the veins and cells used in the key.

*Chaetotaxy.*—Chaetotaxy refers to the arrangement and number of the cuticular bristles. For the purposes of description a bristle is defined as a hair of outstanding length and thickness. The smaller thickened hairs are termed setulae. The distinction between bristles and setulae is only one of degree but is a most convenient one. It is not considered necessary to describe or illustrate the thoracic chaetotaxy of muscoid Diptera as satisfactory accounts and diagrams appear in most textbooks of systematic entomology (*e.g.*, Tillyard, 1926, Fig. W12). The chaetotaxy of the head is less frequently fully described and is therefore illustrated in Fig. 5.